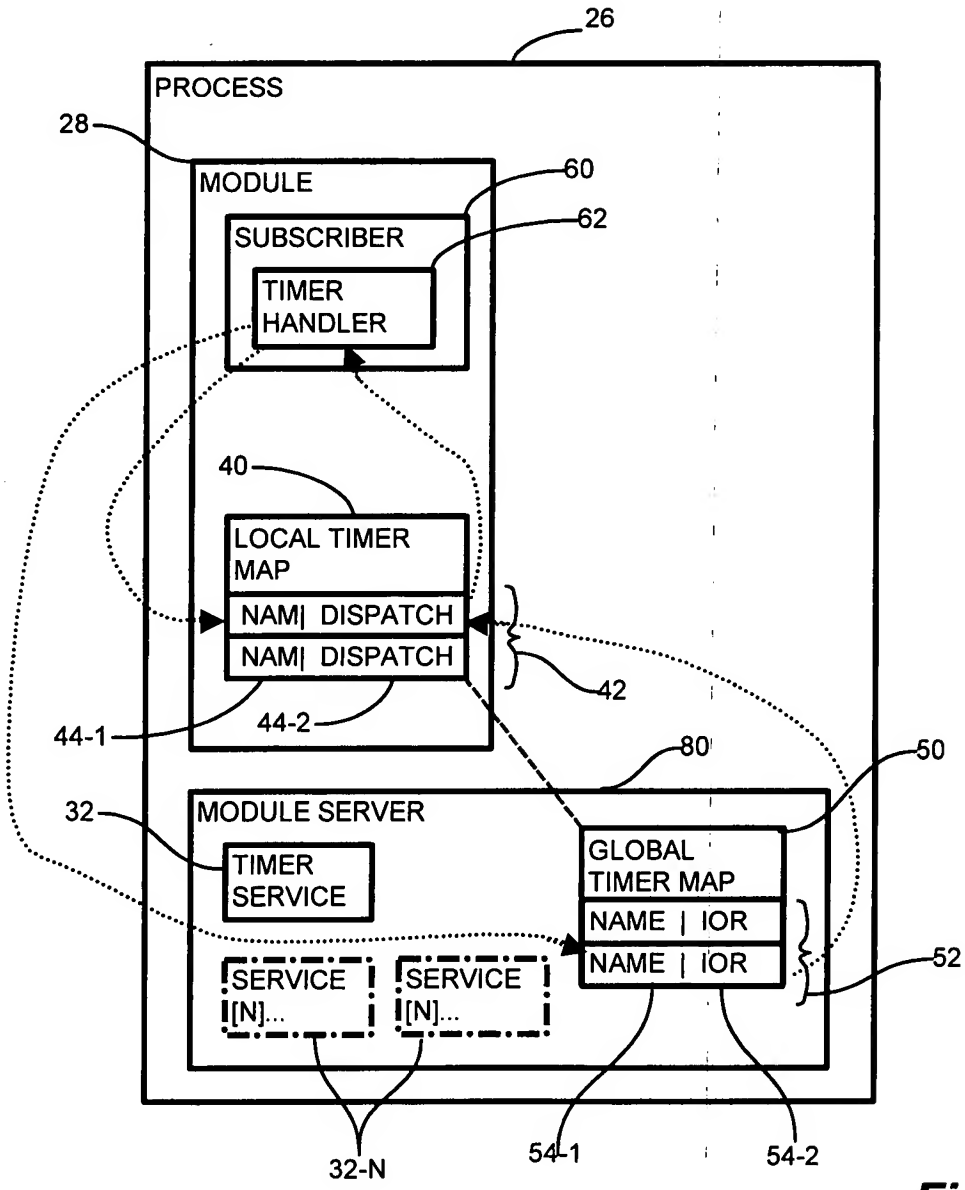
26
PROCESS
28
MODULE
60
SUBSCRIBER
62
TIMER HANDLER
40
LOCAL TIMER MAP
NAM| DISPATCH
NAM| DISPATCH
42
44-1
44-2
80
50
MODULE SERVER
32
TIMER SERVICE
GLOBAL TIMER MAP
NAME | IOR
NAME | IOR
52
SERVICE [N]...
SERVICE [N]...
32-N
54-1
54-2

Fig. 1

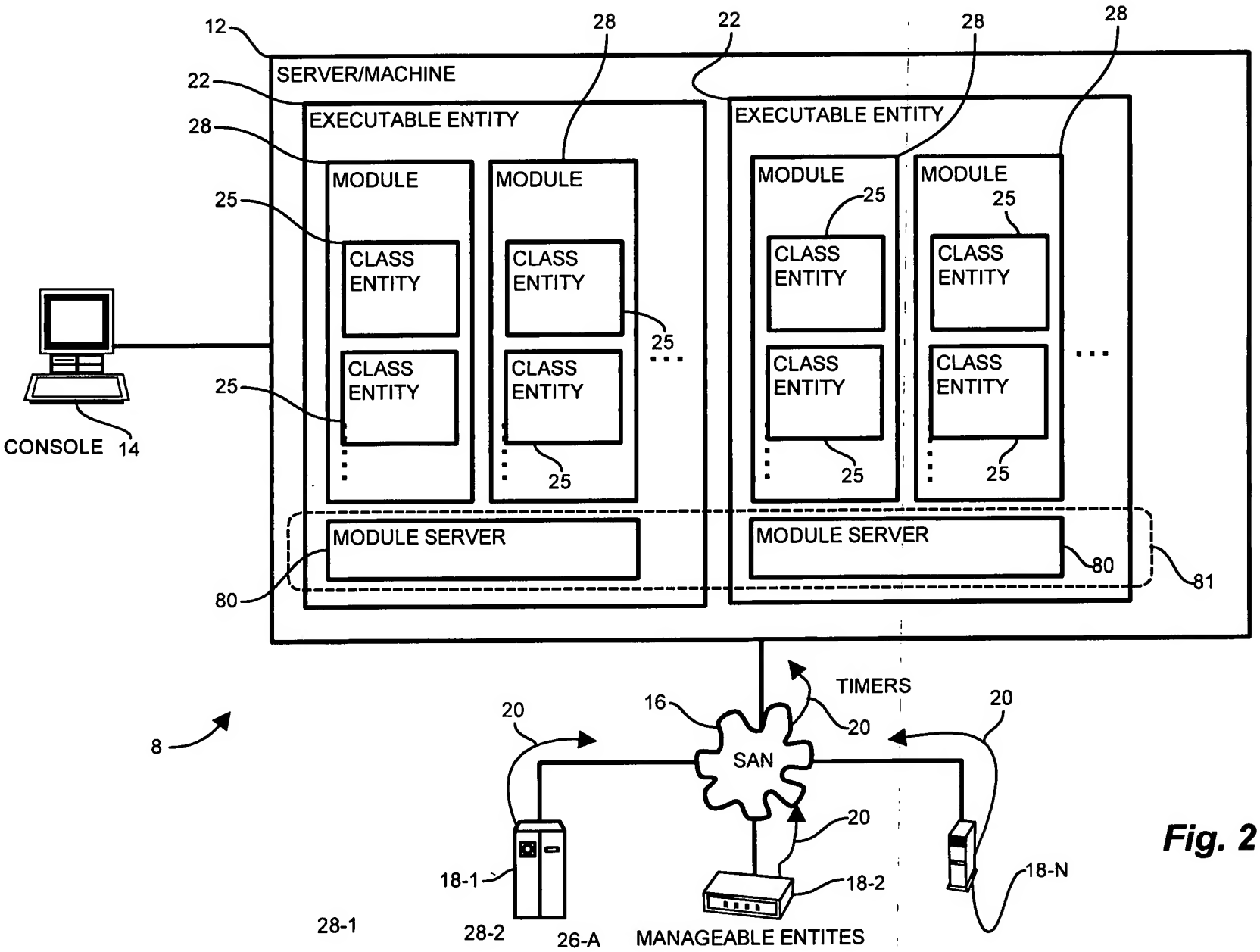
12
28
22
28
28
22
SERVER/MACHINE
EXECUTABLE ENTITY
EXECUTABLE ENTITY
28
MODULE
MODULE
MODULE
MODULE
25
CLASS ENTITY
CLASS ENTITY
CLASS ENTITY
CLASS ENTITY
CLASS ENTITY
CLASS ENTITY
CLASS ENTITY
CLASS ENTITY
25
25
25
25
25
25
25
CONSOLE 14
MODULE SERVER
MODULE SERVER
80
80
81
TIMERS
16
20
20
20
20
SAN
8
18-1
18-2
18-N
28-1
28-2
26-A
MANAGEABLE ENTITES

Fig. 2

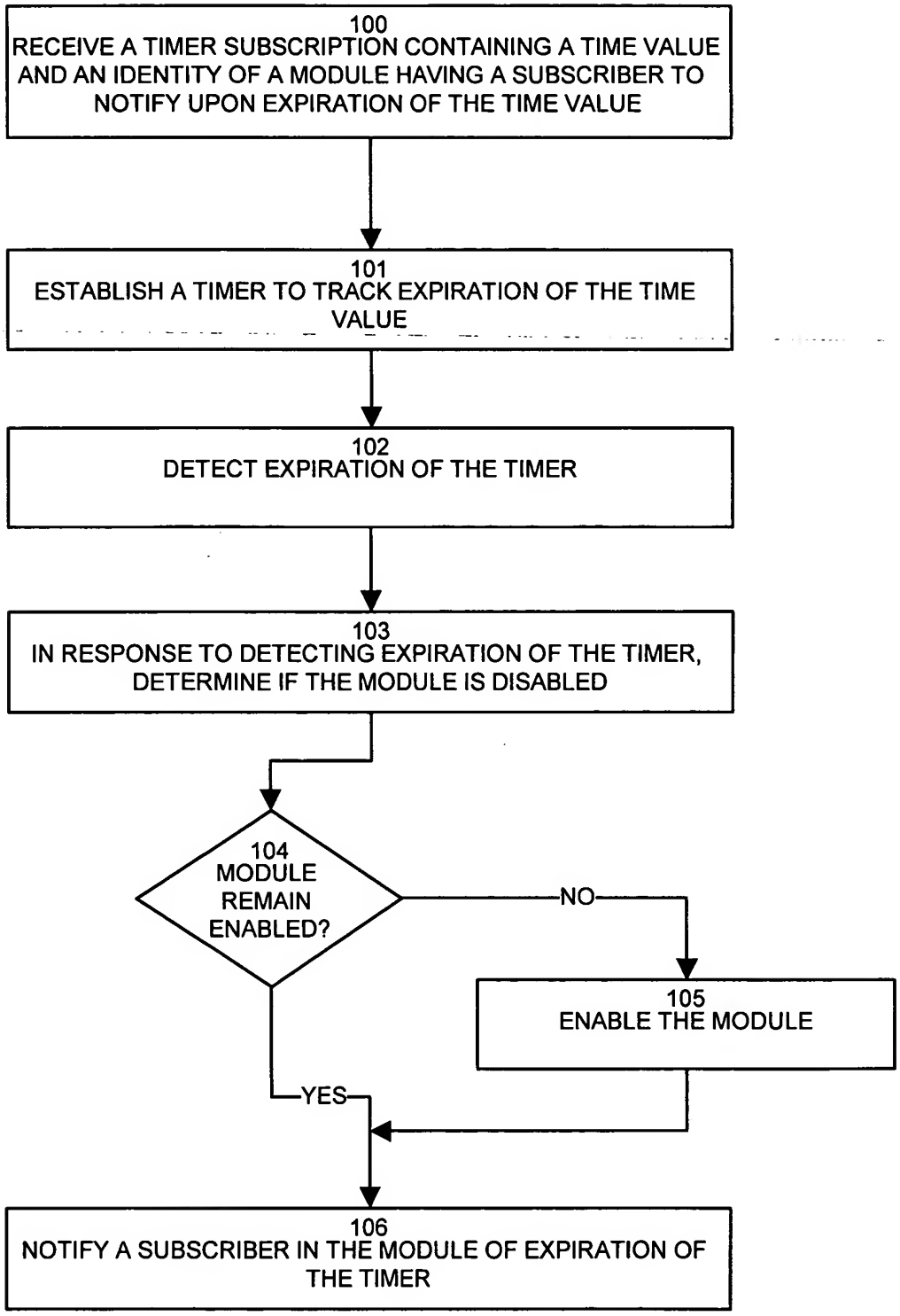
100
RECEIVE A TIMER SUBSCRIPTION CONTAINING A TIME VALUE AND AN IDENTITY OF A MODULE HAVING A SUBSCRIBER TO NOTIFY UPON EXPIRATION OF THE TIME VALUE
101
ESTABLISH A TIMER TO TRACK EXPIRATION OF THE TIME VALUE
102
DETECT EXPIRATION OF THE TIMER
103
IN RESPONSE TO DETECTING EXPIRATION OF THE TIMER, DETERMINE IF THE MODULE IS DISABLED
104
MODULE REMAIN ENABLED?
NO
105
ENABLE THE MODULE
YES
106
NOTIFY A SUBSCRIBER IN THE MODULE OF EXPIRATION OF THE TIMER

Fig. 3

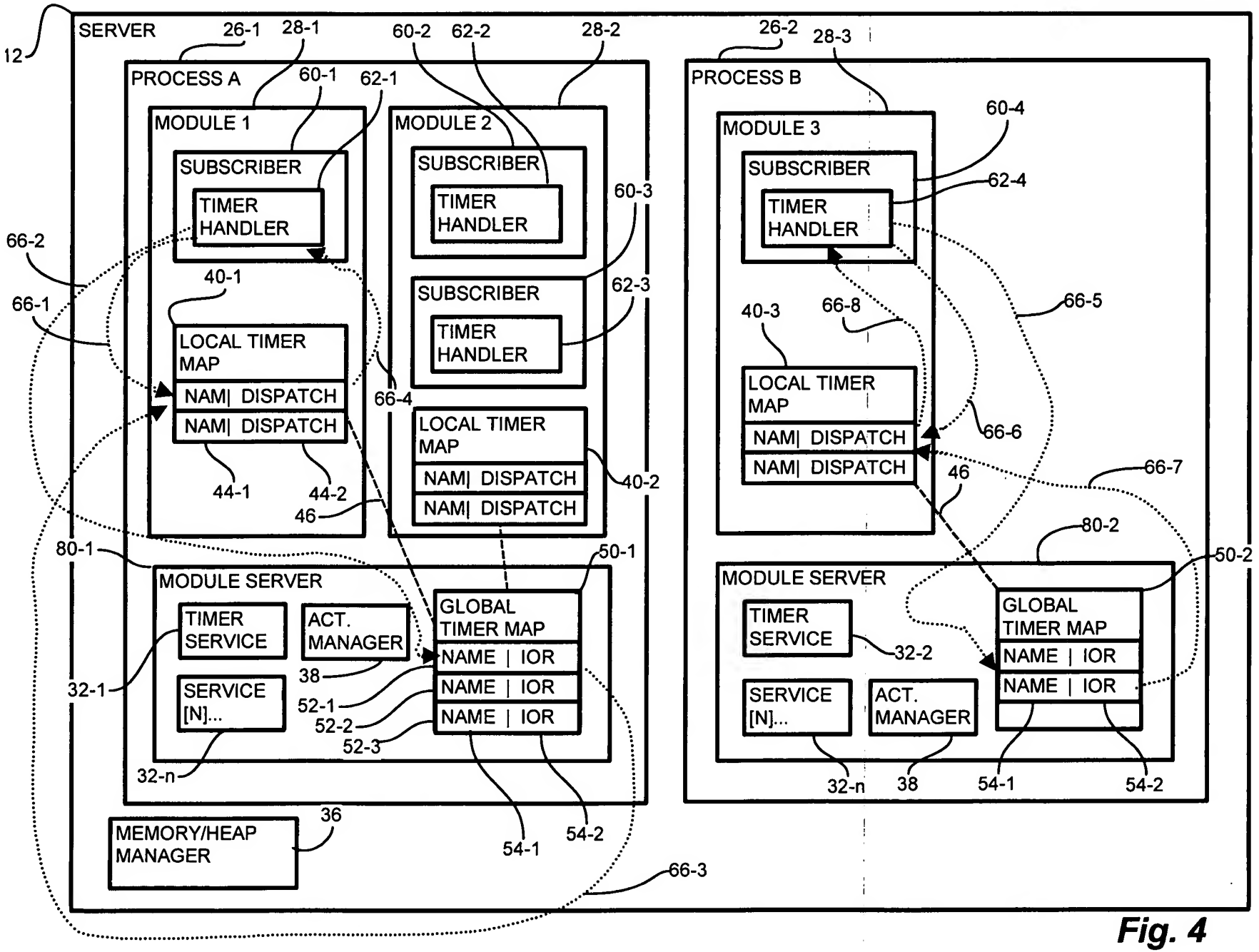
12
SERVER
26-1
28-1
60-2
62-2
28-2
26-2
28-3
PROCESS A
PROCESS B
60-1
62-1
MODULE 1
MODULE 2
MODULE 3
60-4
SUBSCRIBER
TIMER HANDLER
62-4
60-3
62-3
66-2
66-1
40-1
LOCAL TIMER MAP
NAM| DISPATCH
66-4
66-8
66-5
40-3
66-6
44-1
44-2
46
40-2
66-7
80-1
50-1
80-2
50-2
MODULE SERVER
TIMER SERVICE
ACT. MANAGER
GLOBAL TIMER MAP
NAME | IOR
32-1
38
52-1
52-2
52-3
SERVICE [N]...
32-2
32-n
54-1
54-2
MEMORY/HEAP MANAGER
36
66-3

Fig. 4

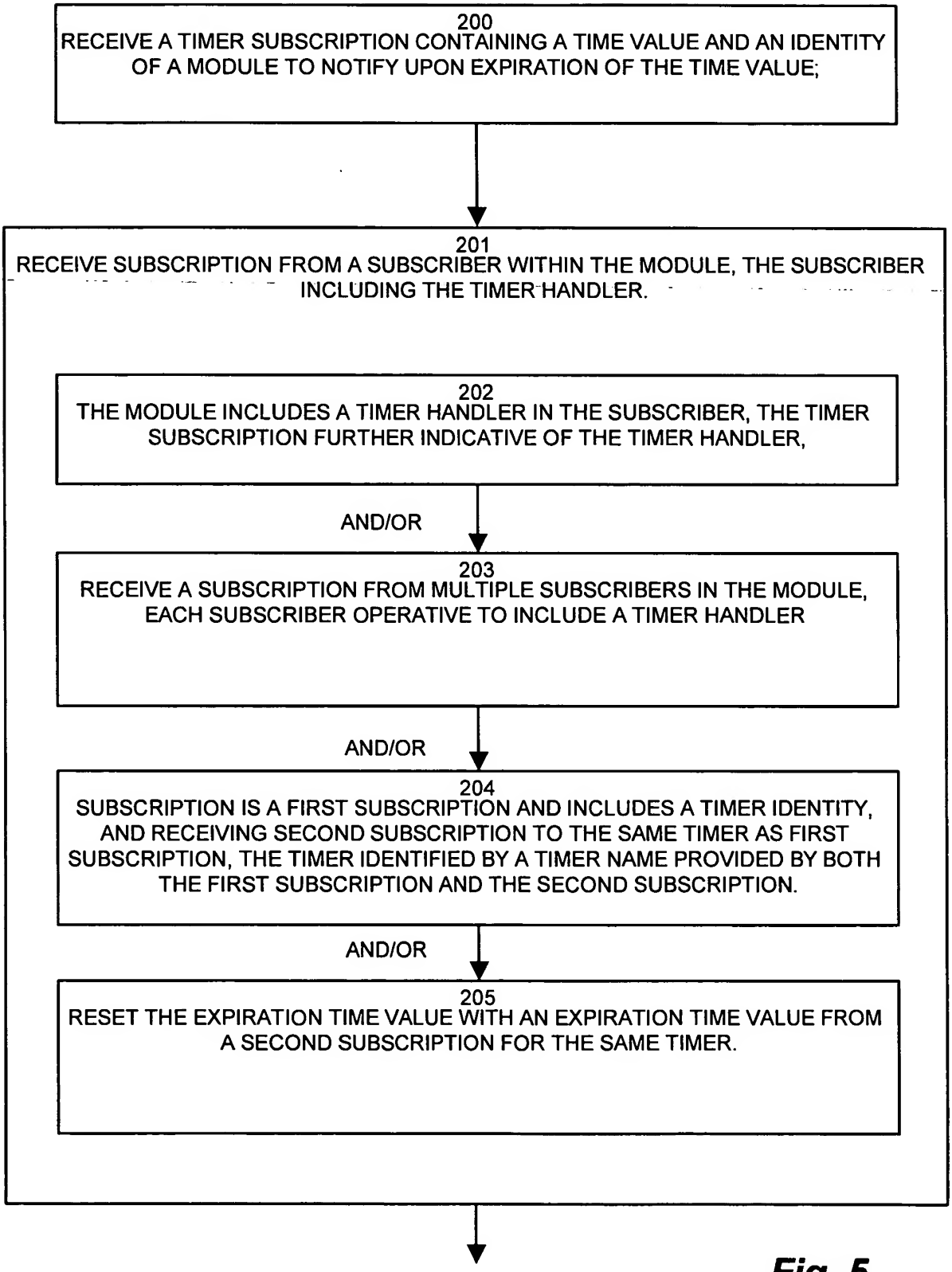
200
RECEIVE A TIMER SUBSCRIPTION CONTAINING A TIME VALUE AND AN IDENTITY OF A MODULE TO NOTIFY UPON EXPIRATION OF THE TIME VALUE;
201
RECEIVE SUBSCRIPTION FROM A SUBSCRIBER WITHIN THE MODULE, THE SUBSCRIBER INCLUDING THE TIMER HANDLER.
202
THE MODULE INCLUDES A TIMER HANDLER IN THE SUBSCRIBER, THE TIMER SUBSCRIPTION FURTHER INDICATIVE OF THE TIMER HANDLER,
AND/OR
203
RECEIVE A SUBSCRIPTION FROM MULTIPLE SUBSCRIBERS IN THE MODULE, EACH SUBSCRIBER OPERATIVE TO INCLUDE A TIMER HANDLER
AND/OR
204
SUBSCRIPTION IS A FIRST SUBSCRIPTION AND INCLUDES A TIMER IDENTITY, AND RECEIVING SECOND SUBSCRIPTION TO THE SAME TIMER AS FIRST SUBSCRIPTION, THE TIMER IDENTIFIED BY A TIMER NAME PROVIDED BY BOTH THE FIRST SUBSCRIPTION AND THE SECOND SUBSCRIPTION.
AND/OR
205
RESET THE EXPIRATION TIME VALUE WITH AN EXPIRATION TIME VALUE FROM A SECOND SUBSCRIPTION FOR THE SAME TIMER.

Fig. 5

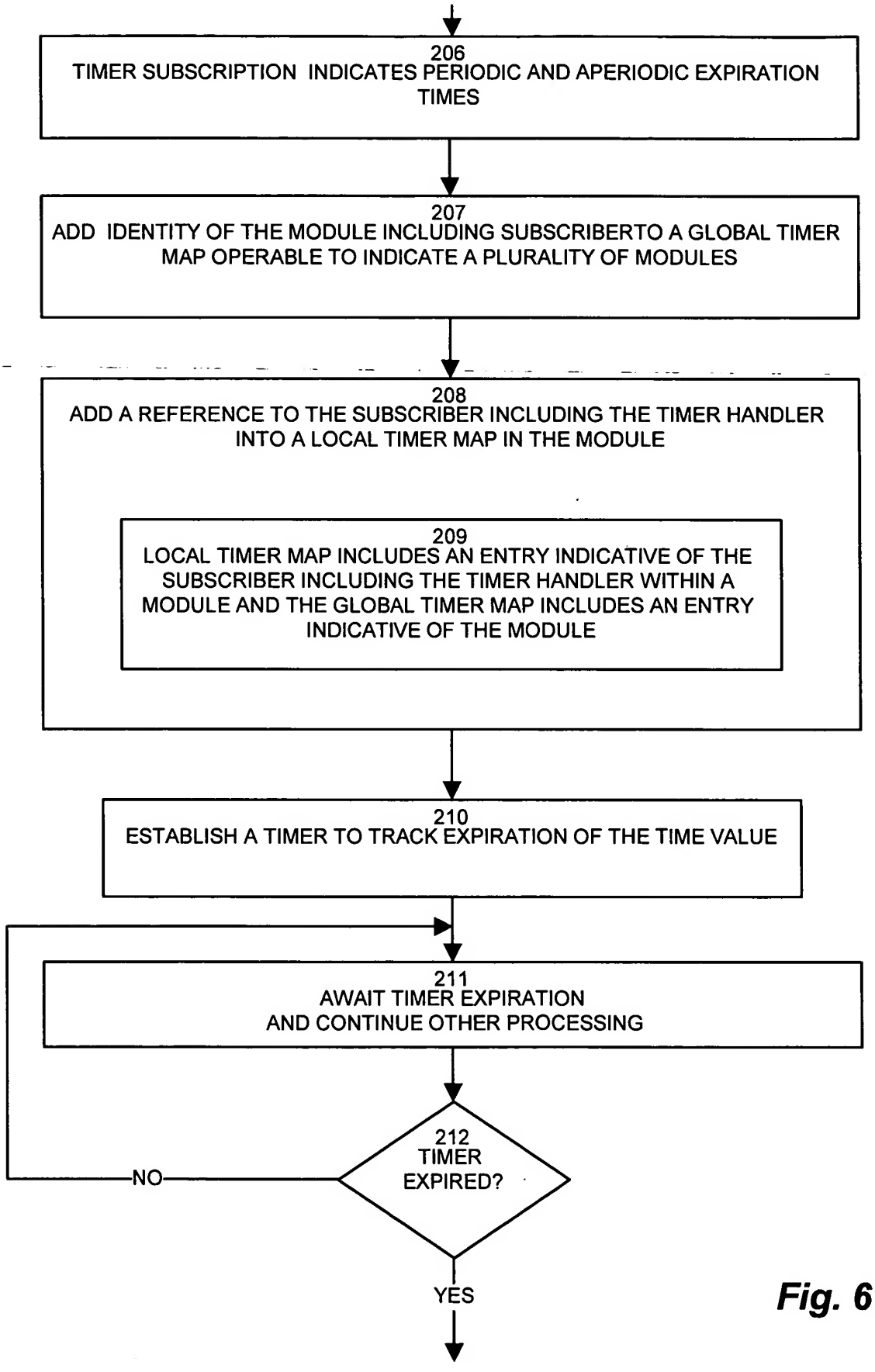
206
TIMER SUBSCRIPTION INDICATES PERIODIC AND APERIODIC EXPIRATION TIMES
207
ADD IDENTITY OF THE MODULE INCLUDING SUBSCRIBERTO A GLOBAL TIMER MAP OPERABLE TO INDICATE A PLURALITY OF MODULES
208
ADD A REFERENCE TO THE SUBSCRIBER INCLUDING THE TIMER HANDLER INTO A LOCAL TIMER MAP IN THE MODULE
209
LOCAL TIMER MAP INCLUDES AN ENTRY INDICATIVE OF THE SUBSCRIBER INCLUDING THE TIMER HANDLER WITHIN A MODULE AND THE GLOBAL TIMER MAP INCLUDES AN ENTRY INDICATIVE OF THE MODULE
210
ESTABLISH A TIMER TO TRACK EXPIRATION OF THE TIME VALUE
211
AWAIT TIMER EXPIRATION
AND CONTINUE OTHER PROCESSING
212
TIMER
EXPIRED?
NO
YES

Fig. 6

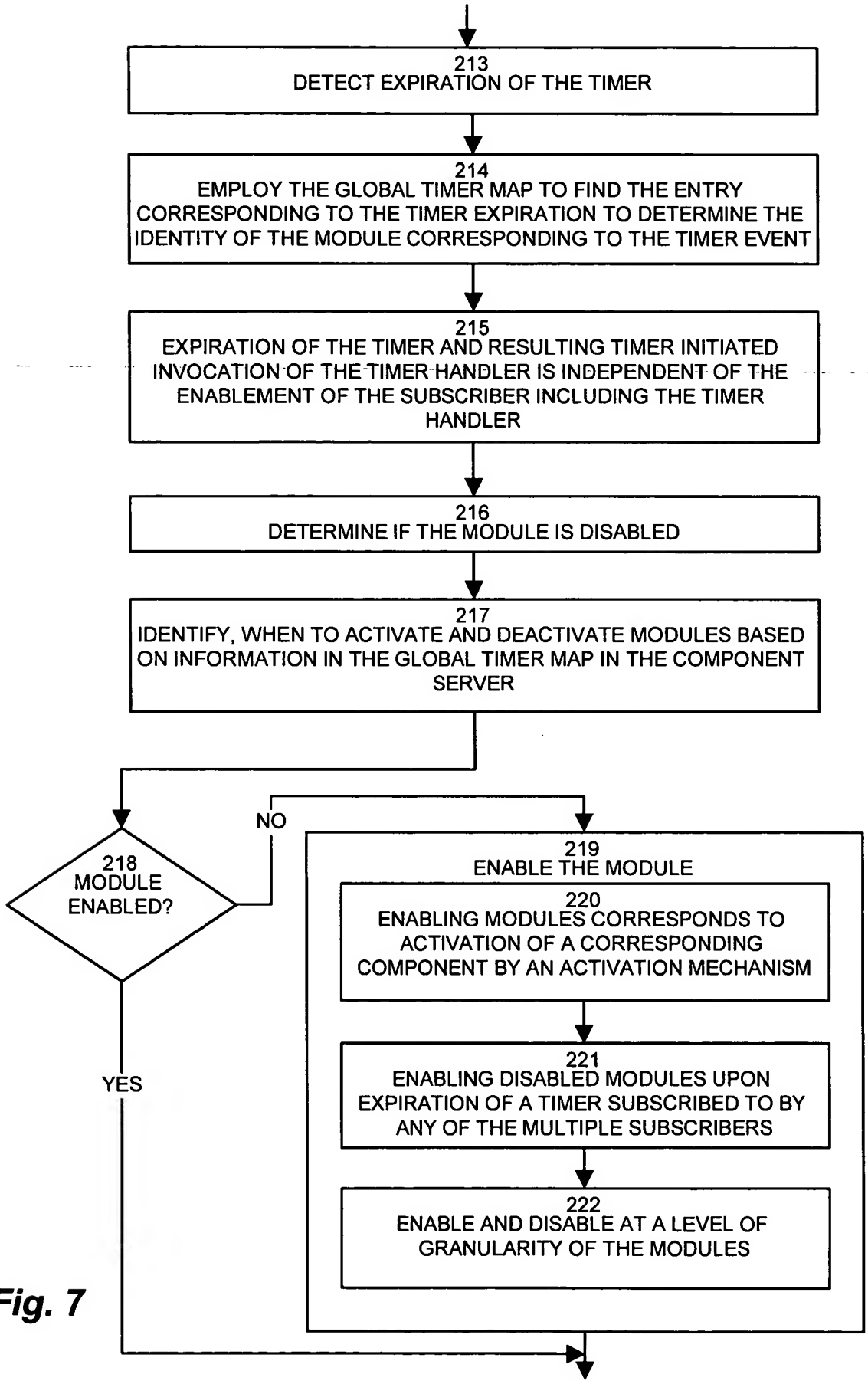
213
DETECT EXPIRATION OF THE TIMER
214
EMPLOY THE GLOBAL TIMER MAP TO FIND THE ENTRY CORRESPONDING TO THE TIMER EXPIRATION TO DETERMINE THE IDENTITY OF THE MODULE CORRESPONDING TO THE TIMER EVENT
215
EXPIRATION OF THE TIMER AND RESULTING TIMER INITIATED INVOCATION OF THE TIMER HANDLER IS INDEPENDENT OF THE ENABLEMENT OF THE SUBSCRIBER INCLUDING THE TIMER HANDLER
216
DETERMINE IF THE MODULE IS DISABLED
217
IDENTIFY, WHEN TO ACTIVATE AND DEACTIVATE MODULES BASED ON INFORMATION IN THE GLOBAL TIMER MAP IN THE COMPONENT SERVER
218
MODULE ENABLED?
NO
YES
219
ENABLE THE MODULE
220
ENABLING MODULES CORRESPONDS TO ACTIVATION OF A CORRESPONDING COMPONENT BY AN ACTIVATION MECHANISM
221
ENABLING DISABLED MODULES UPON EXPIRATION OF A TIMER SUBSCRIBED TO BY ANY OF THE MULTIPLE SUBSCRIBERS
222
ENABLE AND DISABLE AT A LEVEL OF GRANULARITY OF THE MODULES

Fig. 7

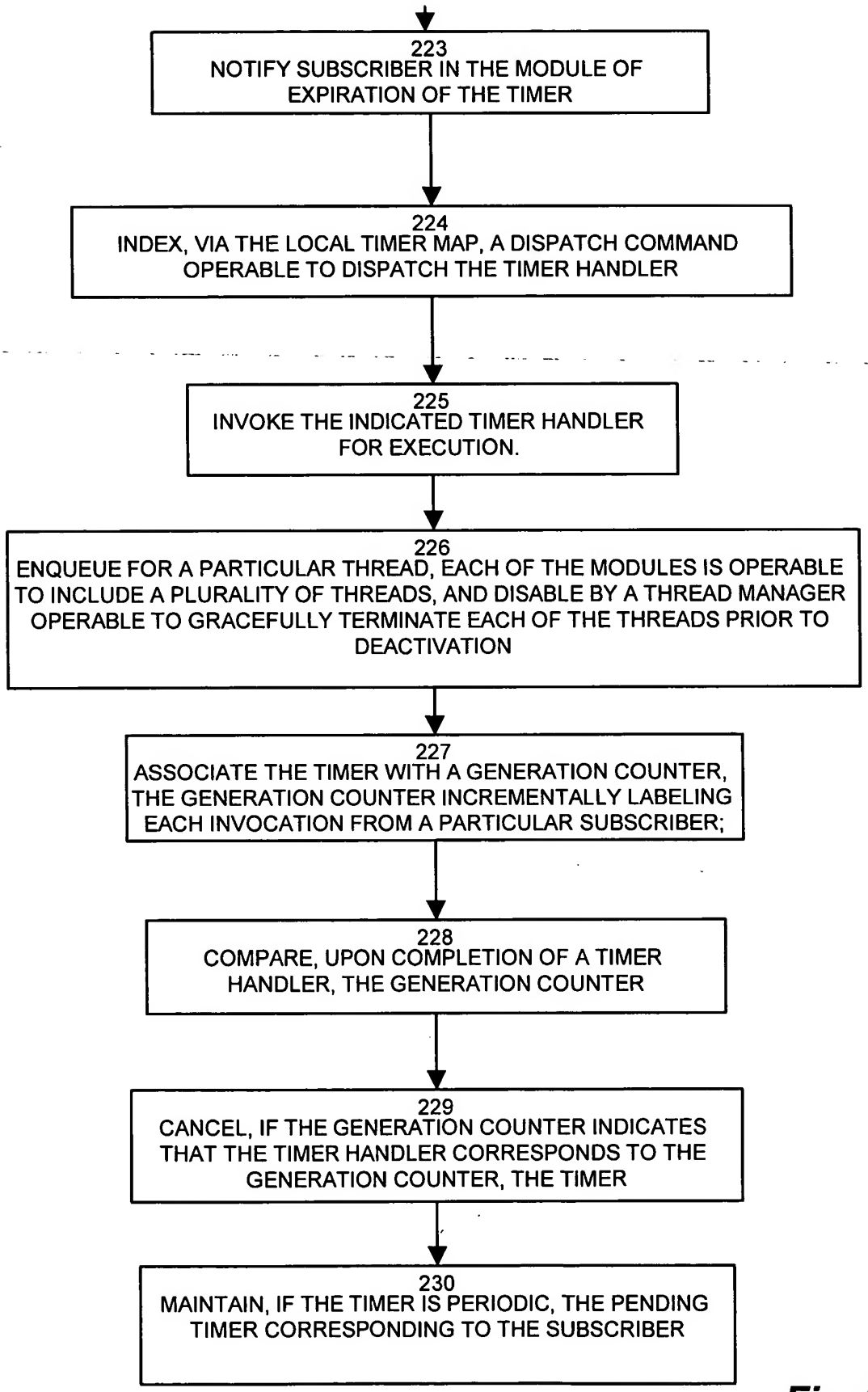
223
NOTIFY SUBSCRIBER IN THE MODULE OF EXPIRATION OF THE TIMER
224
INDEX, VIA THE LOCAL TIMER MAP, A DISPATCH COMMAND OPERABLE TO DISPATCH THE TIMER HANDLER
225
INVOKE THE INDICATED TIMER HANDLER FOR EXECUTION.
226
ENQUEUE FOR A PARTICULAR THREAD, EACH OF THE MODULES IS OPERABLE TO INCLUDE A PLURALITY OF THREADS, AND DISABLE BY A THREAD MANAGER OPERABLE TO GRACEFULLY TERMINATE EACH OF THE THREADS PRIOR TO DEACTIVATION
227
ASSOCIATE THE TIMER WITH A GENERATION COUNTER, THE GENERATION COUNTER INCREMENTALLY LABELING EACH INVOCATION FROM A PARTICULAR SUBSCRIBER;
228
COMPARE, UPON COMPLETION OF A TIMER HANDLER, THE GENERATION COUNTER
229
CANCEL, IF THE GENERATION COUNTER INDICATES THAT THE TIMER HANDLER CORRESPONDS TO THE GENERATION COUNTER, THE TIMER
230
MAINTAIN, IF THE TIMER IS PERIODIC, THE PENDING TIMER CORRESPONDING TO THE SUBSCRIBER

Fig. 8

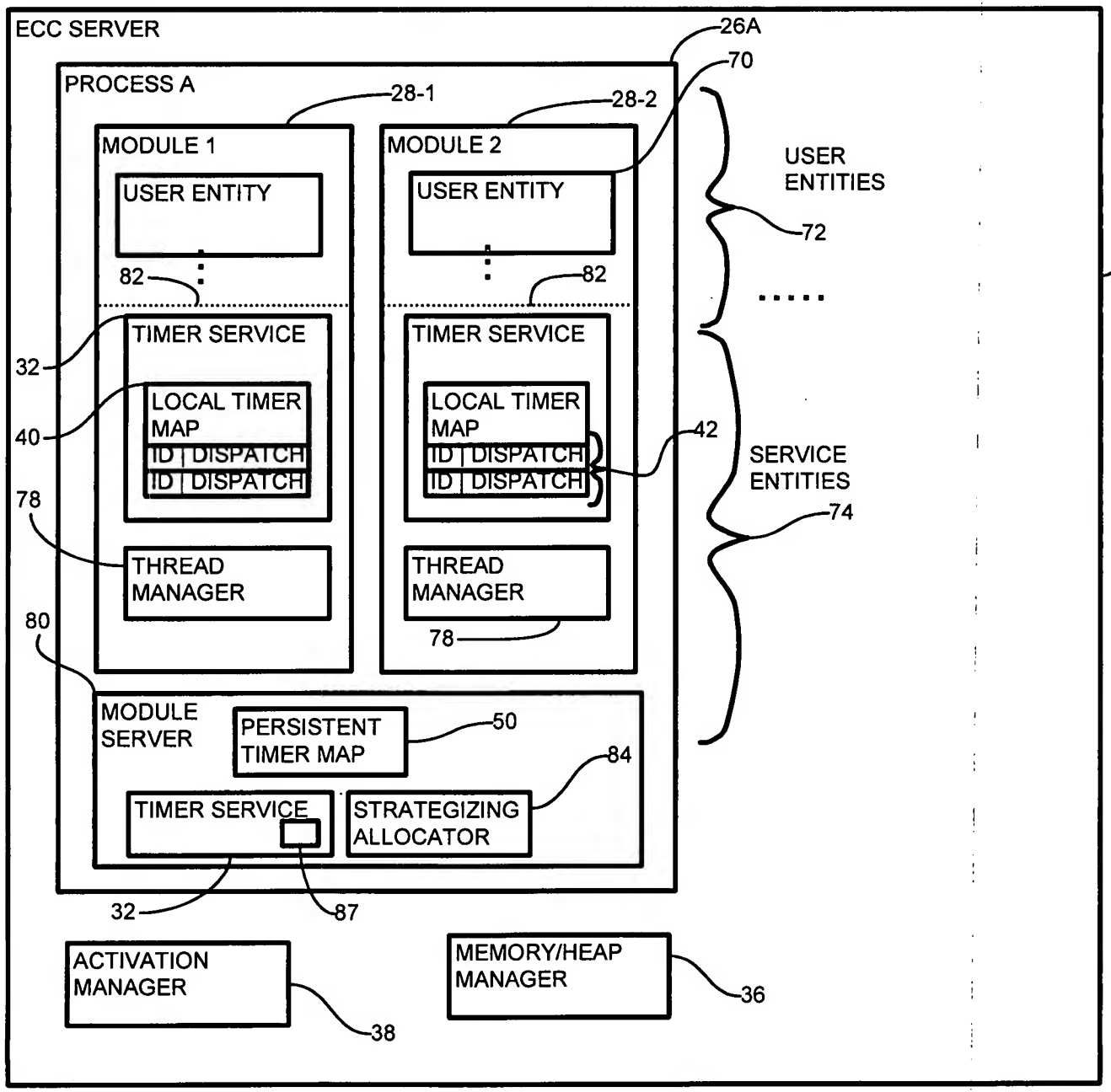
ECC SERVER
26A
70
PROCESS A
28-1
28-2
MODULE 1
MODULE 2
USER ENTITY
USER ENTITY
USER ENTITIES
72
68
82
82
TIMER SERVICE
TIMER SERVICE
32
LOCAL TIMER MAP
ID | DISPATCH
ID | DISPATCH
40
LOCAL TIMER MAP
ID | DISPATCH
ID | DISPATCH
42
78
SERVICE ENTITIES
74
THREAD MANAGER
THREAD MANAGER
78
80
MODULE SERVER
PERSISTENT TIMER MAP
50
84
TIMER SERVICE
STRATEGIZING ALLOCATOR
32
87
ACTIVATION MANAGER
38
MEMORY/HEAP MANAGER
36

Fig. 9

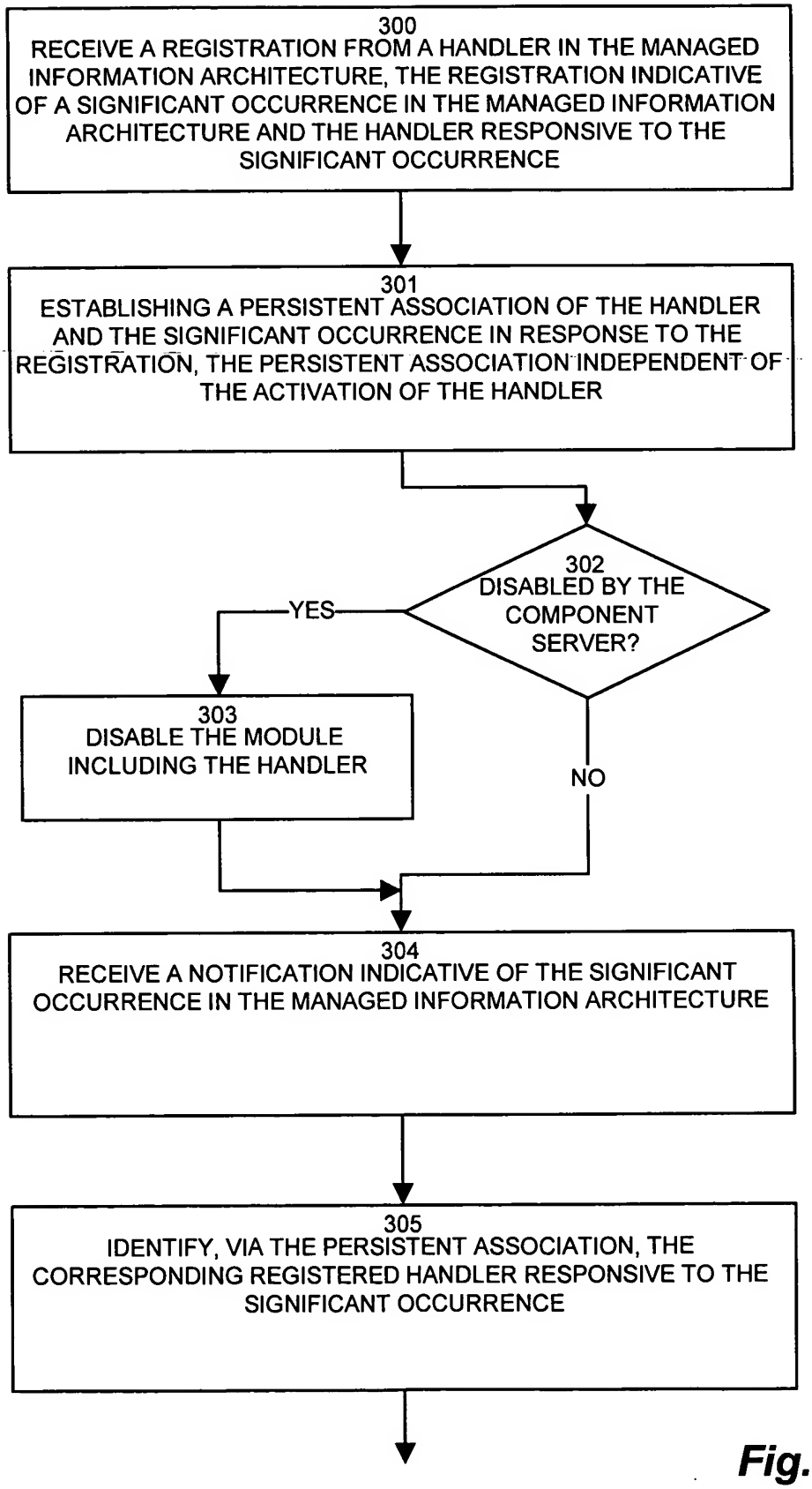
300
RECEIVE A REGISTRATION FROM A HANDLER IN THE MANAGED INFORMATION ARCHITECTURE, THE REGISTRATION INDICATIVE OF A SIGNIFICANT OCCURRENCE IN THE MANAGED INFORMATION ARCHITECTURE AND THE HANDLER RESPONSIVE TO THE SIGNIFICANT OCCURRENCE
301
ESTABLISHING A PERSISTENT ASSOCIATION OF THE HANDLER AND THE SIGNIFICANT OCCURRENCE IN RESPONSE TO THE REGISTRATION, THE PERSISTENT ASSOCIATION INDEPENDENT OF THE ACTIVATION OF THE HANDLER
302
DISABLED BY THE COMPONENT SERVER?
YES
NO
303
DISABLE THE MODULE INCLUDING THE HANDLER
304
RECEIVE A NOTIFICATION INDICATIVE OF THE SIGNIFICANT OCCURRENCE IN THE MANAGED INFORMATION ARCHITECTURE
305
IDENTIFY, VIA THE PERSISTENT ASSOCIATION, THE CORRESPONDING REGISTERED HANDLER RESPONSIVE TO THE SIGNIFICANT OCCURRENCE

Fig. 10

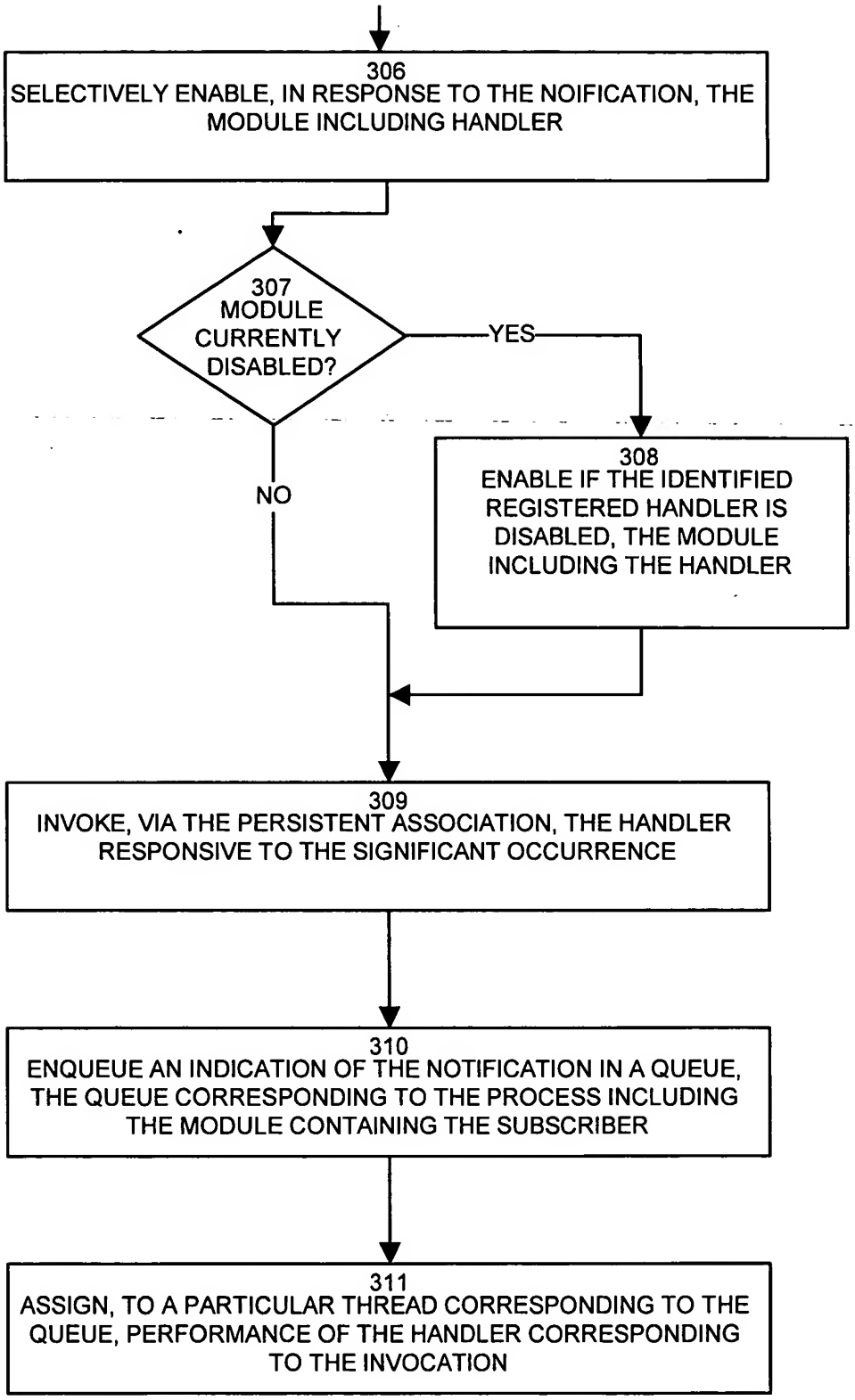
306
SELECTIVELY ENABLE, IN RESPONSE TO THE NOIFICATION, THE MODULE INCLUDING HANDLER
307
MODULE CURRENTLY DISABLED?
YES
NO
308
ENABLE IF THE IDENTIFIED REGISTERED HANDLER IS DISABLED, THE MODULE INCLUDING THE HANDLER
309
INVOKE, VIA THE PERSISTENT ASSOCIATION, THE HANDLER RESPONSIVE TO THE SIGNIFICANT OCCURRENCE
310
ENQUEUE AN INDICATION OF THE NOTIFICATION IN A QUEUE, THE QUEUE CORRESPONDING TO THE PROCESS INCLUDING THE MODULE CONTAINING THE SUBSCRIBER
311
ASSIGN, TO A PARTICULAR THREAD CORRESPONDING TO THE QUEUE, PERFORMANCE OF THE HANDLER CORRESPONDING TO THE INVOCATION

Fig. 11